

## CLAIMS

1. A communication system comprising a first information processor, a second information processor, a first communication control unit for controlling the communication of the first information processor, a second communication control unit for controlling the communication of the second information processor, and a server for establishing communication between the first information processor and second information processor,

wherein the first information processor includes:

a reference port receiver for receiving reference port information showing the position of the reference port as the port in the second communication control unit as the reference for target of transmission of bubble packet sent for leaving the transmission record in the first communication unit,

a bubble packet transmitter for transmitting the bubble packet to the second communication control unit by way of the first communication control unit on the basis of the reference port information,

a detection packet transmitter for transmitting a port detection packet to the server for detecting the position of bubble packet transmitting port as the port of the first communication control unit used in transmission of the bubble packet, and

a reply packet receiver for receiving a reply packet sent from the second information processor by way of the second communication control unit to the bubble packet transmitting port,

the second information processor includes:

a reference port detection packet transmitter for transmitting reference port detection packet for detecting the position of reference port,

a bubble packet transmitting port receiver for receiving the bubble packet

transmitting port information showing the position of bubble packet transmitting port, and

a reply packet transmitter for transmitting a reply packet to the bubble packet transmitting port indicated by the bubble packet transmitting port information, and  
the server includes:

a reference port detector for receiving the reference port detection packet sent from the second information processor, and detecting the position of the reference port on the basis of the reference port detection packet,

a reference port transmitter for transmitting the reference port information showing the position of the reference port detected by the reference port detector to the first information processor,

a bubble packet transmitting port detector for receiving the port detection packet sent from the first information processor, and detecting the position of bubble packet transmitting port on the basis of the port detection packet, and

a bubble packet transmitting port transmitter for transmitting the bubble packet transmitting port information to the second information processor.

2. The communication system of claim 1,

wherein the server further includes:

a re-send instruction transmitter for transmitting a re-send instruction as an instruction for transmitting the bubble packet and port detection packet again to the first information processor in the case the position of the bubble packet transmitting port cannot be detected by the bubble packet transmitting port detector,

the first information processor further includes:

a re-send instruction receiver for receiving the re-send instruction sent from the server,

the detection packet transmitter transmits the port detection packet again to the server when the re-send instruction receiver receives the re-send instruction, and

the bubble packet transmitter transmits the bubble packet again to the server when the re-send instruction receiver receives the re-send instruction.

3. The communication system of claim 1 or 2,

wherein the first information processor further includes:

a re-reply packet transmitter for transmitting a re-reply packet to the port of the second communication control unit used in transmission of the reply packet when the reply packet receiver receives the reply packet, and

the second information processor further includes:

a re-reply packet receiver for receiving the re-reply packet.

4. A first information processor communicating with a second information processor by way of a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor, comprising:

a reference port receiver for receiving reference port information showing the position of reference port as the port in the second communication control unit as reference for target of transmission of bubble packet sent for leaving the transmission record in the first communication control unit,

a bubble packet transmitter for transmitting the bubble packet to the second communication control unit by way of the first communication control unit on the basis of the reference port information,

a detection packet transmitter for transmitting the port detection packet for detecting the position of the bubble packet transmitting port as the port of the first

communication control unit used in transmission of bubble packet, and

a reply packet receiver for receiving the reply packet transmitted from the second information processor to the bubble packet transmitting port by way of the second communication control unit.

5. The first information processor of claim 4, wherein the reference port is the latest port at the moment of transmission of the reference port detection packet for detecting the position of the reference port from the second information processor, among the ports assigned in the second communication control unit.

6. The first information processor of claim 4 or 5, wherein the detection packet transmitter transmits the port detection packet before and after transmission of the bubble packet by the bubble packet transmitter.

7. The first information processor of claim 6, wherein the bubble packet and port detection packet are transmitted by using different ports in the first communication control unit.

8. The first information processor of claim 7, wherein the bubble packet and port detection packet are transmitted by using newly assigned ports in the first information processor.

9. The first information processor of claim 4, further comprising:

a re-send instruction receiver for receiving a re-send instruction as an instruction for transmitting the bubble packet and port detection packet again,

wherein the detection packet transmitter for transmitting the port detection packet again when the re-send instruction receiver receives the re-send instruction, and

the bubble packet transmitter transmits the bubble packet again when the re-send instruction receiver receives the re-send instruction.

10. The first information processor of claim 4, further comprising:

a port number differential detection packet transmitter for transmitting the port number differential detection packet for detecting the port number differential in the first communication control unit by way of the first communication control unit.

11. The first information processor of claim 4, wherein the bubble packet transmitting target port as the target port for transmitting the bubble packet in the second communication control unit is a port assigned after specified port assignment from the reference port.

12. The first information processor of claim 11, further comprising a port number differential receiver for receiving port number differential information as the information showing the port number differential in the second communication control unit,

wherein the bubble packet transmitter transmits the bubble packet to the bubble packet transmitting target port of which port interval to the reference port is M times of port number differential (M being an integer of 1 or more) indicated by the port number differential information.

13. The first information processor of claim 4, further comprising a re-reply packet transmitter for transmitting a re-reply packet to the port of the second communication control unit used in transmission of the reply packet when the reply packet receiver receives the reply packet.

14. A first information processor communicating with a second information processor by way of a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor,

wherein the first communication control unit receives a bubble packet for

leaving the transmission record in the second communication control unit from the second information processor by way of the second communication control unit, further including:

a reference port detection packet transmitter for transmitting reference port detection packet for detecting the position of reference port as the port in the first communication control unit as the reference for target of transmission of the bubble packet,

a bubble packet transmitting port receiver for receiving the bubble packet transmitting port information showing the position of bubble packet transmitting port as the port of the second communication control unit used in transmission of the bubble packet from the second information processor, and

a reply packet transmitter for transmitting a reply packet to the bubble packet transmitting port indicated by the bubble packet transmitting port information.

15. The first information processor of claim 14, wherein the reply packet transmitter transmits the reply packet by using N different ports (N being an integer of 2 or more) of the first communication control unit.

16. The first information processor of claim 15, wherein the N ports are newly assigned in the first communication control unit when transmitting the reply packet.

17. The first information processor of claim 15 or 16, wherein the number N is more than the number of ports that can be assigned from the reference port to the port for transmitting the bubble packet.

18. The first information processor of claim 14, further comprising:

a re-reply packet receiver for receiving a re-reply packet sent from the second information processor to the port of the first communication control unit used in transmission of the reply packet.

19. The first information processor of claim 14, further comprising:

a port number differential detection packet transmitter for transmitting the port number differential detection packet for transmitting the port number differential in the first communication control unit by way of the first communication control unit.

20. A server for establishing communication between a first information processor and a second information processor by way of a first communication control unit for controlling communication of the first information processor and a second communication control unit for controlling communication of the second information processor, comprising:

a reference port detector for receiving a reference port detection packet sent from the second information processor by way of the second communication control unit, in order to detect the position of the reference port as the port in the second communication control unit as the reference for target of transmission of bubble packet sent from the first information processor for leaving transmission record in the first communication control unit, and detecting the position of the reference port on the basis of the reference port detection packet,

a reference port transmitter for transmitting the reference port information showing the position of the reference port detected by the reference port detector to the first information processor,

a bubble packet transmitting port detector for receiving the port detection packet sent from the first information processor, in order to detect the position of the bubble packet transmitting port as the port in the first communication control unit used in transmission of bubble packet from the first information processor to the second communication control unit, and detecting the position of the bubble packet transmitting port on the basis of the port detection packet, and

a bubble packet transmitting port transmitter for transmitting bubble packet transmitting port information showing the position of the bubble packet transmitting port detected by the bubble packet transmitting port detector to the second information processor.

21. The server of claim 20, further comprising:

a re-send instruction transmitter for transmitting a re-send instruction as an instruction for transmitting the bubble packet and port detection packet again to the first information processor in the case the position of the bubble packet transmitting port cannot be detected by the bubble packet transmitting port detector.

22. The server of claim 20 or 21, wherein the bubble packet transmitting port detector receives the port detection packets sent before and after transmission of the bubble packet, and judges if two ports in the first communication control unit used in transmission of port detection packets and the bubble packet transmitting port are consecutive or not, and if consecutive, the position of the port enclosed by two ports is detected as the position of the bubble packet transmitting port.

23. The server of claim 22, wherein the bubble packet transmitting port detector judges as being consecutive when the interval of two ports of the first communication control unit used in transmission of port detection packets is 2 times of port number differential of the first communication control unit.

24. The server of claim 23, further comprising:

a first port number differential detector for receiving a first port number differential detection packet sent from the first information processor by way of the first communication control unit, and detecting the port number differential in the first communication control unit on the basis of the first port number differential detection packet,



wherein the bubble port transmitting packet detector judges by using the port number differential detected by the first port number differential detector.

25. The server of claim 20, further comprising:

a second port number differential detector for receiving a second port number differential detection packet sent from the second information processor by way of the second communication control unit, and detecting the port number differential in the second communication control unit on the basis of the second port number differential detection packet, and

a port number differential transmitter for transmitting the port number differential information showing the port number differential detected by the second port number differential detector to the first information processor.

26. A communication method of establishing communication between a first information processor and a second information processor by way of a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor, comprising:

a reference port detection packet transmitting step of transmitting a reference port detection packet for detecting the position of the reference port as the port in the second communication control unit as the reference for target of transmission of bubble packet sent by the first information processor for leaving the transmission record in the first communication control unit by the second information processor by way of the second communication control unit,

a reference port detecting step of receiving the reference port detection packet, and detecting the position of the reference port,

a reference port transmitting step of transmitting the reference port information

as the information showing the position of the reference port detected at the reference port detecting step,

- a reference port receiving step of receiving the reference port information,

- a bubble packet transmitting step of transmitting the bubble packet to the second communication control unit by way of the first communication control unit on the basis of the reference port information received at the reference port receiving step by the first information processor,

- a bubble packet transmitting port detecting step of detecting the position of the bubble packet transmitting port as the port of the first communication control unit used in transmission of the bubble packet,

- a bubble packet transmitting port transmitting step of transmitting the bubble packet transmitting port information showing the position of the bubble packet transmitting port detected at the bubble packet transmitting port detecting step,

- a bubble packet transmitting port receiving step of receiving the bubble packet transmitting port information, and

- a reply step of transmitting a reply packet from the second information processor to the bubble packet transmitting port indicated by the bubble packet transmitting port information received at the bubble packet transmitting port receiving step.

27. The communication method of claim 26, wherein the bubble packet transmitting port detecting step includes:

- a first transmitting step of transmitting a first port detection packet for specifying the bubble packet transmitting port from the first information processor by way of the first communication control unit before transmission of bubble packet,

- a first detecting step of receiving the first port detection packet and detecting

the position of the first port as the port of the first communication control unit used in transmission of the first port detection packet,

a second transmitting step of transmitting a second port detection packet for specifying the bubble packet transmitting port from the first information processor by way of the first communication control unit after transmission of bubble packet,

a second detecting step of receiving the second port detection packet and detecting the position of the second port as the port of the first communication control unit used in transmission of the second port detection packet, and

a port detecting step of detecting the position of the bubble packet transmitting port on the basis of the position of the first port and the position of the second port.

28. The communication method of claim 27, wherein the bubble packet transmitting port detecting step further includes:

a judging step of judging if the first port and second port detected at the first detecting step and second detecting step, and the bubble packet transmitting port are consecutive or not, and

the port detecting step is characterized by detecting the position of the bubble packet transmitting port when judged to be consecutive at the judging step.

29. The communication method of claim 28, wherein if judged not to be consecutive at the judging step, the process of the first transmitting step, first detecting step, bubble packet transmitting step, second transmitting step, second detecting step, and judging step is repeated until judged to be consecutive at the judging step.

30. The communication method of any one of claims 26 to 29, further comprising:

a first address acquiring step of acquiring the address of the second

communication control unit by the first information processor,

wherein the bubble packet transmitting step is characterized by transmitting the bubble packet to the address acquired at the first address acquiring step.

31. The communication method of claim 26, further comprising:

a second address acquiring step of acquiring the address of the first communication control unit by the second information processor,

wherein the reply step is characterized by transmitting the reply packet to the address acquired at the second address acquiring step.

32. The communication method of claim 26, wherein the process of each step is executed again if failing to establish communication between the first information processor and second information processor by transmission of reply packet at the reply step.

33. The communication method of claim 26, further comprising:

a reply receiving step of receiving the reply packet, and

a re-reply step of sending a re-reply packet to the port of the second communication control unit used in transmission of the reply packet by the first information processor when the reply packet is received at the reply packet receiving step.

34. The communication method of claim 33, wherein the process of each step is executed again if failing to establish communication between the first information processor and second information processor by transmission of reply packet at the reply step.

35. A program for causing a computer to execute the process in a first information processor for communicating with a second information processor by way of a first communication control unit for controlling the communication of the

first information processor and a second communication control unit for controlling the communication of the second information processor, wherein the computer executes:

a reference port receiving step of receiving the reference port information showing the position of the reference port as the port in the second communication control unit as the reference for target of transmission of bubble packet transmitted for leaving the communication record in the first communication control unit,

a bubble packet transmitting step of transmitting the bubble packet to the second communication control unit by way of the first communication control unit on the basis of the reference port information,

a detection packet transmitting step of transmitting a port detection packet for detecting the position of bubble packet transmitting port as the port of the first communication control unit used in transmission of the bubble packet, and

a reply packet receiving step of receiving the reply packet transmitted to the bubble packet transmitting port from the second information processor by way of the second communication control unit.

36. The program of claim 35, wherein the reference port is the latest port at the moment of transmission of the reference port detection packet for detecting the position of the reference port from the second information processor among the ports assigned in the second communication control unit.

37. The program of claim 35 or 36, wherein the detection packet transmitting step is characterized by transmission of port detection packet before and after transmission of bubble packet at the bubble packet transmitting step.

38. The program of claim 37, wherein the bubble packet and port detection packet are transmitted by using different ports in the first communication control

unit.

39. The program of claim 38, wherein the bubble packet and port detection packet are transmitted by using newly assigned ports in the first information processor.

40. The program of claim 35, wherein the computer further executes:

a re-send instruction receiving step of receiving a re-send instruction for transmitting the bubble packet and port detection packet again,

the detection packet transmitting step is characterized by transmitting the port detection packet again when the re-send instruction is received at the re-send instruction receiving step, and

the bubble packet transmitting step is characterized by transmitting the bubble step again when the re-send instruction is received at the re-send instruction receiving step.

41. The program of claim 35, wherein the computer further executes:

a port number differential detection packet transmitting step of transmitting the port number differential detection packet for detecting the port number differential in the first communication control unit by way of the first communication control unit.

42. The program of claim 35, wherein the bubble packet transmitting target port as the target port for transmitting the bubble packet in the second communication control unit is a port assigned after specified port assignment from the reference port.

43. The program of claim 42, wherein the computer further executes:

a port number differential receiving step of receiving port number differential information as the information showing the port number differential in the second

communication control unit, and

the bubble packet transmitting step is characterized by transmitting the bubble packet to the bubble packet transmitting target port of which port interval to the reference port is  $M$  times of port number differential ( $M$  being an integer of 1 or more) indicated by the port number differential information.

44. The program of claim 35, wherein the computer further executes:

a re-reply packet transmitting step of transmitting a re-reply packet to the port of the second communication control unit used in transmission of the reply packet when the reply packet is received at the reply packet receiving step.

45. A program for causing a computer to execute the process in a first information processor for communicating with a second information processor by way of a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor,

wherein the first communication control unit receives a bubble packet for leaving the transmission record in the second communication control unit from the second information processor by way of the second communication control unit, further executing:

a reference port detection packet transmitting step of transmitting reference port detection packet for detecting the position of reference port as the port in the first communication control unit as the reference for target of transmission of the bubble packet,

a bubble packet transmitting port receiving step of receiving the bubble packet transmitting port information showing the position of bubble packet transmitting port as the port of the second communication control unit used in transmission of

the bubble packet from the second information processor, and

a reply packet transmitting step of transmitting a reply packet to the bubble packet transmitting port indicated by the bubble packet transmitting port information.

46. The program of claim 45, wherein the reply packet transmitting step is characterized by transmitting the reply packet by using N different ports (N being an integer of 2 or more) of the first communication control unit.

47. The program of claim 46, wherein the N ports are newly assigned in the first communication control unit when transmitting the reply packet.

48. The program of claim 46 or 47, wherein the number N is more than the number of ports that can be assigned from the reference port to the port for transmitting the bubble packet in the first communication control unit.

49. The program of claim 45, wherein the computer further executes:

a re-reply packet receiving step of receiving a re-reply packet sent from the second information processor to the port of the first communication control unit used in transmission of the reply packet.

50. The program of claim 45, wherein the computer further executes:

a port number differential detection packet transmitting step of transmitting the port number differential detection packet for transmitting the port number differential in the first communication control unit by way of the first communication control unit.

51. A program for causing a computer to execute the process in a server for establishing communication between a first information processor and a second information processor by way of a first communication control unit for controlling communication of the first information processor and a second communication control unit for controlling communication of the second information processor,



wherein the computer executes:

a reference port detecting step of receiving a reference port detection packet sent from the second information processor by way of the second communication control unit, in order to detect the position of the reference port as the port in the second communication control unit as the reference for target of transmission of bubble packet sent from the first information processor for leaving transmission record in the first communication control unit, and detecting the position of the reference port on the basis of the reference port detection packet,

a reference port transmitting step of transmitting the reference port information showing the position of the reference port detected by the reference port detector to the first information processor,

a bubble packet transmitting port detecting step of receiving the port detection packet sent from the first information processor, in order to detect the position of the bubble packet transmitting port as the port in the first communication control unit used in transmission of bubble packet from the first information processor to the second communication control unit, and detecting the position of the bubble packet transmitting port on the basis of the port detection packet, and

a bubble packet transmitting port transmitting step of transmitting bubble packet transmitting port information showing the position of the bubble packet transmitting port detected by the bubble packet transmitting port detector to the second information processor.

52. A communication system comprising a first information processor, a second information processor, a first communication control unit for controlling the communication of the first information processor, a second communication control unit for controlling the communication of the second information processor and a

server for establishing communication between the first information processor and second information processor,

wherein the first information processor includes:

a reference port receiver for receiving reference port information showing the position of the reference port as the port in the second communication control unit as the reference for target of transmission of bubble packet sent for leaving the transmission record in the first communication unit,

a bubble packet transmitter for transmitting the bubble packet to the second communication control unit by way of the first communication control unit on the basis of the reference port information,

a detection packet transmitter for transmitting a port detection packet to the server for detecting the position of bubble packet transmitting port as the port of the first communication control unit used in transmission of the bubble packet,

a reply packet receiver for receiving a reply packet sent from the second information processor by way of the second communication control unit to the bubble packet transmitting port,

a detection port information receiver for receiving the detection port information showing the position of the port of the first communication control unit allowing to pass the port detection packet,

a bubble packet transmitting port detector for detecting the position of the bubble packet transmitting port on the basis of the detection port information received in the detection port information receiver, and

a bubble packet transmitting port transmitter for transmitting the bubble packet transmitting port information showing the position of the bubble packet transmitting port detected by the bubble packet transmitting port detector to the second

information processor by way of the server,

the second information processor includes:

a reference port detection packet transmitter for transmitting reference port detection packet for detecting the position of reference port,

a bubble packet transmitting port receiver for receiving the bubble packet transmitting port information showing the position of bubble packet transmitting port, and

a reply packet transmitter for transmitting a reply packet to the bubble packet transmitting port indicated by the bubble packet transmitting port information, and

the server includes:

a reference port detector for receiving the reference port detection packet sent from the second information processor and detecting the position of the reference port on the basis of the reference port detection packet,

a reference port transmitter for transmitting the reference port information showing the position of the reference port detected by the reference port detector to the first information processor,

a detector for detecting port number for receiving the port detection packet sent from the first information processor and detecting the position of the port of the first communication control unit allowing to pass the port detection packet on the basis of the port detection packet, and

a port number information transmitter for port differential detection for transmitting the detection port information showing the position of the port detected by the detector for detecting port number to the first information processor.

53. The first information processor of claim 4, further comprising:

a detection port information receiver for receiving the detection port

information showing the position of the first communication control unit allowing to pass the port detection packet,

a bubble packet transmitting port detector for detecting the position of the bubble packet transmitting port on the basis of the detection port information received in the detection port information receiver, and

a bubble packet transmitting port transmitter for transmitting the bubble packet transmitting port information showing the position of the bubble packet transmitting port detected in the bubble packet transmitting port detector.

54. The first information processor of claim 53, wherein the bubble packet transmitting port detector, if failing to detect the position of the bubble packet transmitting port, transfers a re-send instruction of the port detection packet to the detection packet transmitter, and transfers a re-send instruction of the bubble packet to the bubble packet transmitter,

the detection packet transmitter transmits the port detection packet again according to the instruction, and

the bubble packet transmitter transmits the bubble packet again according to the instruction.

55. The first information processor claim of 53 or 54, further comprising:

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting the port number differential in the first communication control unit by way of the first communication control unit,

a port differential information receiver for receiving the port differential information showing the position of the port of the first communication control unit allowing to pass the port number differential detection packet, and

a port number differential detector for detecting the port number differential in

the first communication control unit on the basis of the port differential information received in the port differential information receiver,

wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential in the first communication control unit detected in the port number differential detector.

56. The first information processor of claim 19, further comprising:

a port differential information receiver for receiving the port differential information showing the position of the port of the first communication control unit allowing to pass the port number differential detection packet,

a port number differential detector for detecting the port number differential in the first communication control unit on the basis of the port differential information received in the port differential information receiver, and

a port number differential information transmitter for transmitting the port number differential information showing the port number differential in the first communication control unit detected in the port number differential detector.

57. A server for establishing communication between a first information processor and a second information processor by way of a first communication control unit for controlling communication of the first information processor and a second communication control unit for controlling communication of the second information processor, comprising:

a reference port detector for receiving a reference port detection packet sent from the second information processor by way of the second communication control unit, in order to detect the position of the reference port as the port in the second communication control unit as the reference for target of transmission of bubble packet sent from the first information processor for leaving transmission record in

the first communication control unit, and detecting the position of the reference port on the basis of the reference port detection packet,

a reference port transmitter for transmitting the reference port information showing the position of the reference port detected by the reference port detector to the first information processor,

a detector for detecting port number for receiving the port detection packet sent from the first information processor, in order to detect the position of the bubble packet transmitting port as the port in the first communication control unit used in transmission of the bubble packet from the first information processor to the second communication control unit, and detecting the position of the port of the first communication control unit allowing to pass the port detection packet on the basis of the port detection packet, and

a port number information transmitter for port differential detection for transmitting the detection port information showing the position of the port detected by the detector for detecting port number to the first information processor.

58. The server of claim 57, further comprising:

a first port number differential detector for receiving a first port number differential detection packet sent from the first information processor by way of the first communication control unit and detecting the position of the port in the first communication control unit allowing to pass the first port number differential detection packet on the basis of the first port number differential detection packet, and

a first port number differential information transmitter for transmitting the port number differential detection information showing the position of the port detected by the first port number differential detector to the first information processor.

59. The server of claim 57 or 58, further comprising:

a second port number differential detector for receiving a second port number differential detection packet sent from the second information processor by way of the second communication control unit, and detecting the position of the port in the second communication control unit allowing to pass the second port number differential detection packet on the basis of the second port number differential detection packet, and

a second port number differential information transmitter for transmitting the port number differential detection information showing the position of the port detected by the second port number differential detector to the second information processor.

60. The program of claim 35, wherein the computer further executes:

a port differential information receiving step of receiving the port differential information showing the position of the port of the first communication control unit allowing to pass the port detection packet,

a bubble packet transmitting port detecting step of detecting the position of the bubble packet transmitting port on the basis of the port differential information received at the port differential information receiving step, and

a bubble packet transmitting port transmitting step of transmitting the bubble packet transmitting port information showing the position of the bubble packet transmitting port detected at the bubble packet transmitting port detecting step.

61. The program of claim 60, wherein at the detection packet transmitting step, if the position of the bubble packet transmitting port cannot be detected at the bubble packet transmitting port detecting step, the port detection packet is transmitted again, or

at the bubble packet transmitting step, if the position of the bubble packet transmitting port cannot be detected at the bubble packet transmitting port detecting step, the bubble packet is transmitted again.

62. The program of claim 60 or 61, wherein the computer further executes:

a port number differential detection packet transmitting step of transmitting a port number differential detection packet for detecting the port number differential in the first communication control unit by way of the first communication control unit,

a port differential information receiving step of receiving the port differential information showing the position of the port of the first communication control unit allowing to pass the port number differential detection packet, and

a port number differential detecting step of detecting the port number differential in the first communication control unit on the basis of the port differential information received in the port differential information receiver, and

the bubble packet transmitting port detecting step is characterized by detecting the position of the bubble packet transmitting port by using the port number differential in the first communication control unit detected at the port number differential detecting step.

63. The program of claim 50, wherein the computer further executes:

a port differential information receiving step of receiving the port differential information showing the position of the port of the first communication control unit allowing to pass the port number differential detection packet,

a port number differential detecting step of detecting the port number differential in the first communication control unit on the basis of the port differential information received in the port differential information receiver, and



a port number differential transmitting step of transmitting the port number differential information showing the port number differential in the first communication control unit detected at the port number differential detecting step.

64. A program for causing a computer to execute the process in a server for establishing communication between a first information processor and a second information processor by way of a first communication control unit for controlling communication of the first information processor and a second communication control unit for controlling communication of the second information processor, wherein the computer executes:

a reference port detecting step of receiving a reference port detection packet transmitted from the second information processor by way of the second communication control unit, in order to detect the position of the reference port as the port in the second communication control unit as the reference for target of transmission of bubble packet transmitted by the first information processor for leaving the transmission record in the first communication control unit, and detecting the position of the reference port on the basis of the reference port detection packet,

a reference port transmitting step of transmitting the reference port information showing the position of the reference port detected at the reference port detecting step to the first information processor,

a detection port detecting step of receiving the port detection packet sent from the first information processor, in order to detect the position of the bubble packet transmitting port as the port in the first communication control unit used in transmission of the bubble packet from the first information processor to the second communication control unit, and detecting the position of the port of the first

communication control unit allowing to pass the port detection packet on the basis of the port detection packet, and

a detection port information transmitting step of transmitting the detection port information showing the position of the port detected by the detector for detecting port number to the first information processor.

65. A communication system comprising an information processor, a communication control unit for controlling the communication of the information processor and a server,

wherein the information processor includes:

a bubble packet transmitter for transmitting a bubble packet for leaving the transmission record in the communication control unit by way of the communication control unit, and

a detection packet transmitter for transmitting a port detection packet used in detection of position of bubble packet transmitting port as the port of the communication control unit used in transmission of the bubble packet to the server, before and after transmission of bubble packet by the bubble packet transmitter.

66. The communication system of claim 65, wherein the bubble packet and port detection packet are transmitted by using newly assigned ports in the information processor.

67. The communication system of claim 65, wherein the server further comprises:

a bubble packet transmitting port detector for receiving the port detection packet sent from the information processor and detecting the position of the bubble packet transmitting port on the basis of the port detection packet.

68. The communication system of claim 67, wherein the server further

comprises:

a bubble packet transmitting port transmitter for transmitting the bubble packet transmitting port information showing the position of the bubble packet transmitting port.

69. The communication system of claim 67, wherein the server further comprises:

a re-send instruction transmitter for transmitting a re-send instruction as an instruction for transmitting the bubble packet and port detection packet again to the information processor in the case the position of the bubble packet transmitting port cannot be detected by the bubble packet transmitting port detector,

the information processor further includes:

a re-send instruction receiver for receiving the re-send instruction sent from the server,

the detection packet transmitter transmits the port detection packet again to the server when the re-send instruction receiver receives the re-send instruction, and

the bubble packet transmitter transmits the bubble packet again to the server when the re-send instruction receiver receives the re-send instruction.

70. The communication system of claim 67,

wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential of the communication control unit.

71. The communication system of claim 70,

wherein the information processor further includes:

a port number differential detection packet transmitter for transmitting the port number differential detection packet for detecting the port with in the

communication control unit by way of the communication control unit,

the server further includes:

a port number differential detector for receiving the port number differential detection packet and detecting the port number differential of the communication control unit on the basis of the port number differential detection packet, and

the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential detected by the port number differential detector.

72. The communication system of claim 65 or 66,

wherein the information processor further includes:

a port differential information receiver for receiving the port differential information showing the position of the port of the communication control unit allowing to pass the port number differential detection packet, and

a bubble packet transmitting port detector for detecting the position of the bubble packet transmitting port on the basis of the port differential information received in the port differential information receiver, and

the server further includes:

a detector for detecting port number for receiving the port detection packet and detecting the position of the port of the communication control unit allowing to pass the port detection packet, and

a port number information transmitter for port differential detection for transmitting the detection port information showing the position of the port detected by the detector for detecting port number to the information processor

73. The communication system of claim 72, wherein the information processor further includes:

a bubble packet transmitting port transmitter for transmitting the bubble packet transmitting port information showing the position of the bubble packet transmitting port.

74. The communication system of claim 72, wherein the detection packet transmitter sends the port detection packet again when failing to detect the position of the bubble packet transmitting port by the bubble packet transmitting port detector, and

the bubble packet transmitter sends the bubble packet again when failing to detect the position of the bubble packet transmitting port by the bubble packet transmitting port detector.

75. The communication system of claim 72, wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential of the communication control unit.

76. The communication system of claim 75, wherein the information processor further includes:

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting the port number differential in the communication control unit by way of the communication control unit,

a port differential information receiver for receiving the port differential information showing the position of the port of the communication control unit allowing to pass the port number differential detection packet, and

a port number differential detector for detecting the port number differential in the communication control unit on the basis of the port differential information received in the port differential information receiver,

the server further comprises a port differential information detector for

receiving the port number differential detection packet and detecting the position of the port of the communication control unit allowing to pass the port number differential detection packet, and

a port number information for port differential detection for transmitting the port differential information showing the position of the port detected by the port differential information detector to the information processor, and

the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential in the communication control unit detected in the port number differential detector.

77. The communication system of claim 73, further comprising:

a second information processor including a bubble packet transmitting port receiver for receiving the bubble packet transmitting port information, and

a reply packet transmitter for transmitting a reply packet to the bubble packet transmitting port indicated by the bubble packet transmitting port information,

wherein the information processor further includes:

a reply packet receiver for receiving a reply packet transmitted from the second information processor.

78. An information processor for composing the communication system of claim 65.

79. A second information processor for composing the communication system of claim 77.

80. A server for composing the communication system of claim 65.

81. A communication method used in an information processor composing a communication system comprising an information processor, a communication control unit for controlling the communication of the information processor and a

server, comprising:

a bubble packet transmitting step of transmitting a bubble packet for leaving the transmission record in the communication control unit by way of the communication control unit, and

a detection packet transmitting step of transmitting the port detection packet used for detection of position of the bubble packet transmitting port as the port of the communication control unit used in transmission of the bubble packet to the server, before and after transmission of bubble packet at the bubble packet transmitting step.

82. The communication method of claim 81, further comprising:

a detection port information receiving step of receiving the detection port information showing the position of the port of the communication control unit allowing to pass the port detection packet, and

a bubble packet transmitting port detecting step of detecting the position of the bubble packet transmitting port on the basis of the detection port information received at the detection port information receiving step.

83. The communication method of claim 82, further comprising:

a bubble packet transmitting port transmitting step of transmitting the bubble packet transmitting port information showing the position of the bubble packet transmitting port detected at the bubble packet transmitting port detecting step.

84. A communication method used in a server for composing a communication system comprising an information processor, a communication control unit for controlling the communication of the information processor, and a server, comprising:

a step of receiving port detection packets transmitted from the information

processor before and after transmission of bubble packet in order to detect the position of the bubble packet transmitting port as the port in the communication control used in transmission of the bubble packet transmitted by the information processor for leaving the transmission record in the communication control unit, and

a step of detecting the position of the bubble packet transmitting port on the basis of the port detection packet.

85. A communication method used in a server for composing a communication system comprising an information processor, a communication control unit for controlling the communication of the information processor and a server, comprising:

a step of receiving port detection packets transmitted from the information processor before and after transmission of bubble packet in order to detect the position of the bubble packet transmitting port as the port in the communication control used in transmission of the bubble packet transmitted by the information processor for leaving the transmission record in the communication control unit,

a step of detecting the position of the port of the communication control unit allowing to pass the port detection packet, and

a step of transmitting port differential information showing the position of the port of the communication control unit allowing to pass the port detection packet to the information processor.

86. A program for causing a computer to execute the process in an information processor for composing a communication system comprising an information processor, a communication control unit for controlling the communication of the information processor and a server, wherein the computer executes:



a bubble packet transmitting step of transmitting a bubble packet for leaving the transmission record in the communication control unit by way of the communication control unit, and

a detection packet transmitting step of transmitting port detection packets used for detecting the position of the bubble packet transmitting port as the port in the communication control used in transmission of the bubble packet to the server, before and after transmission of the bubble packet at the bubble packet transmitting step.

87. A program for causing a computer to execute the process in a server for composing a communication system comprising an information processor, a communication control unit for controlling the communication of the information processor and a server, wherein the computer executes:

a step of receiving port detection packets transmitted from the information processor before and after transmission of bubble packet in order to detect the position of the bubble packet transmitting port as the port in the communication control used in transmission of the bubble packet transmitted by the information processor for leaving the transmission record in the communication control unit, and

a step of detecting the position of the bubble packet transmitting port on the basis of the port detection packet.

88. A program for causing a computer to execute the process in a server for composing a communication system comprising an information processor, a communication control unit for controlling the communication of the information processor and a server, wherein the computer executes:

a step of receiving port detection packets transmitted from the information processor before and after transmission of bubble packet in order to detect the

position of the bubble packet transmitting port as the port in the communication control used in transmission of the bubble packet transmitted by the information processor for leaving the transmission record in the communication control unit,

a step of detecting the position of the port of the communication control unit allowing to pass the port detection packet, and

a step of transmitting port differential information showing the position of the port of the communication control unit allowing to pass the e port detection packet to the information processor.